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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/812,152

03/29/2004

David Michael Hoffman

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04/18/2005

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EXAMINER

THOMAS, COURTNEY D

ART UNIT

PAPER NUMBER

2882

DATE MAILED: 04/18/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/812,152

Applicant(s)

HOFFMAN, DAVID MICHAEL

Examiner

Courtney Thomas

Art Unit

2882

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 29 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-38 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3, 5, 6, 8-16, 18-21, 26 and 28-38 is/are rejected.
- 7) ☒ Claim(s) 4, 7, 17, 22-25 and 27 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 02/07/05.
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Claim Objections*

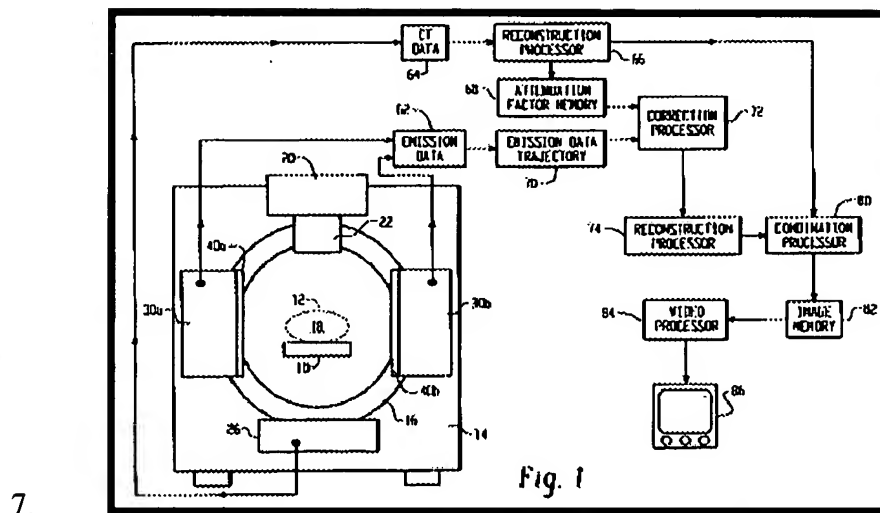
1. Claims 4-6 are objected to because of the following informalities:
2. Claim 4, line 3 recites: "... the x-ray source ..." Examiner suggests the phrase be re-written as: "the **pencil-beam** x-ray source," in order to maintain consistency throughout the claims (see also claims 5 and 6).
3. The claims have not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the claims.
4. Appropriate correction is required.

### *Claim Rejections - 35 USC § 103*

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1, 2, 5, 6, 8-16, 19-21, 26, 28-32, and 34-38 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Popilock (U.S. Patent 6,661,865).



**Fig. 1 – Multi-modal Imaging System – U.S. Patent 6,661,865 to Popilock**

8. As per claims 1, 14 and 31, Popilock discloses a method for performing medical imaging comprising the steps of: imaging a patient (12) utilizing a computed tomography imaging modality, the patient between a collimated X-ray source (20, 22) and X-ray detector (26); and imaging the patient between the collimated X-ray source and the X-ray detector using a nuclear medicine imaging modality (Abstract; column 3, lines 57-58; see also Fig. 4, not shown above). Examiner equates the claimed patient (independent claim 1) as also satisfying the claimed area, recited in independent claim 14. Examiner notes that Popilock does not explicitly use the term pencil-beam, but one having ordinary skill in the art would appreciate the disclosure, cited in column 4, lines 36-39 as relating to the ability to adjust beam cross section via collimator (22) for imaging purposes. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the method of Popilock such that imaging was carried out with a pencil-beam X-ray source. One would have been motivated to make such a modification for the purpose of adjusting irradiating parameters to meet imaging requirements as suggested by Popilock (column 4, lines 36-39; column 8, lines 8-14).

9. As per claim 3, 34, 35 and 37, Popilock discloses a method wherein imaging a patient utilizing nuclear medicine imaging modality and imaging the patient utilized a computed tomography imaging modality are performed sequentially (see Fig. 4, not shown above).

10. As per claims 5, 6, 8-13, 15, 32 and 38, Popilock discloses a method wherein imaging a patient utilizing a computed tomography imaging modality comprises translating at least one of the X-ray detector and the X-ray source along an arcuate path during a portion of a computed tomography scan; directing X-rays at a plurality of predetermined angles during a portion of a computed tomography scan; directing X-rays at a fixed angle and rotating the X-ray source around a longitudinal axis of a viewing area and wherein in nuclear medicine imaging, the method further comprises rotating an emission radiation detector around a longitudinal axis of a viewing area separately from the X-ray source and X-ray detector; and wherein the nuclear medicine imaging modality comprises imaging the patient using at least one of single positron emission computed tomography and positron emission tomography (column 4, lines 34-36; column 4, lines 55-58; column 3, lines 57-58).

11. As per claims 16 and 26, Popilock discloses a multi-modality computed tomography system comprising a gantry (16), an X-ray source (20) a detector (26) and at least one gamma camera (30a, 30b - column 4, lines 55-58).

12. As per claims 19-21 and 28-30, Popilock discloses a multi-modality computed tomography system wherein a second gamma camera is positioned to receive coincident gamma photons emitted in a viewing area; wherein the X-ray source provides pencil beam of X-rays and at a fixed angle with respect to the detector (see Fig. 1 above; column 4, lines 34-58).

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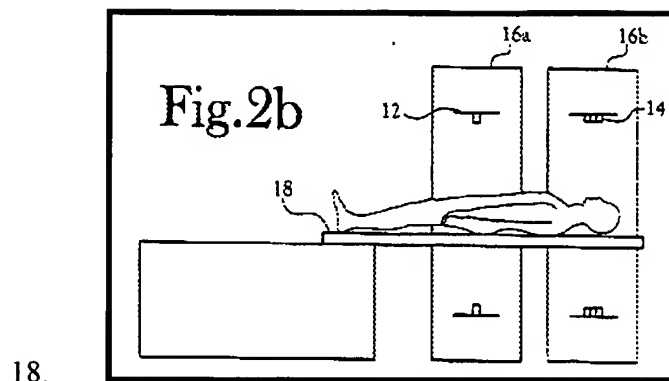
13. Claims 2, 18, 33 and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Popilock (U.S. Patent 6,661,865) in view of Townsend (U.S. Patent 6,490,476).

14. **As per claims 2 and 36**, Popilock discloses a method (and apparatus) for medical imaging as recited in claims 1 and 31, but do not explicitly disclose a method (and apparatus configuration) comprising the step of performing CT and nuclear medicine imaging simultaneously.

15. Townsend et al. disclose a method and apparatus configured to perform CT and nuclear medicine imaging simultaneously. Townsend et al. teach that such arrangement reduces imaging artifacts due to patient motion (column 9, lines 60-64).

16. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the method (and apparatus) of Popilock such that it comprised the step of performing CT and nuclear medicine imaging simultaneously. One would have been motivated to make such a modification for the purpose of reducing imaging artifacts due to patient motion as taught by Townsend et al. (column 9, lines 60-64).

17. **As per claims 18 and 33**, Popilock discloses an apparatus for performing medical imaging as recited in claims 16 and 31, but does not explicitly disclose an apparatus comprising a first gantry supporting an X-ray CT portion and a second gantry supporting a nuclear medicine imaging portion, positioned substantially parallel to the first gantry and axially spaced from the first gantry.



**Fig. 2b – Multi-modal Imaging Apparatus – U.S. Patent 6,490,476 to Townsend et al.**

19. Townsend discloses an apparatus for performing medical imaging wherein the apparatus comprises a first gantry (16a) supporting an X-ray CT portion (i.e. 12) and a second gantry (16b) supporting a nuclear medicine imaging portion (i.e. 14), positioned substantially parallel to the first gantry and axially spaced from the first gantry. Townsend teaches such configuration as negating the need to move a patient from one imaging portion to another, while enabling simultaneous exposures of CT and medical imaging scans subsequent patient injection (column 9, lines 60-67).

20. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Popilock such that it incorporated a first gantry supporting an X-ray CT portion and a second gantry supporting a nuclear medicine imaging portion, positioned substantially parallel to the first gantry and axially spaced from the first gantry. One would have been motivated to make such a modification for the purpose of negating the need to move a patient from one imaging portion to another, while enabling simultaneous exposures of CT and medical imaging scans subsequent patient injection as taught by Townsend (column 9, lines 60-67).

*Allowable Subject Matter*

21. Claims 4, 7, 17, 22-25 and 27 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

22. **As per claim 4**, the examiner found no reference in the prior art that disclosed or made obvious a method wherein imaging a patient utilizing a computed tomography imaging modality comprises translating at least one of an X-ray detector and pencil-beam X-ray source laterally during a portion of a computed tomography scan.

23. **As per claim 7**, the examiner found no reference in the prior art that disclosed or made obvious a method wherein imaging a patient utilizing a computed tomography imaging modality comprises maintaining a gantry, supporting a pencil beam X-ray source and X-ray detector substantially stationary in at least one viewing position while translating at least one of the pencil-beam X-ray source and X-ray detector from a first imaging position to a second imaging position.

24. **As per claims 17 and 27**, the examiner found no reference in the prior art that disclosed or made obvious a multi-modality computed tomography system wherein a gantry is configured to maintain a stationary position while at least one of a pencil-beam X-ray source and X-ray detector are translated from a first imaging position to a second imaging position.

25. **As per claim 22**, the examiner found no reference in the prior art that disclosed or made obvious a multi-modality computed tomography system further comprising a translational mechanism coupled to the gantry, the translational mechanism configured to move at least one of



an X-ray source and X-ray detector from a first position to a second position with respect to the gantry.

26. **As per claim 23**, the examiner found no reference in the prior art that disclosed or made obvious a multi-modality computed tomography system further comprising a translational mechanism associated with each of an X-ray source and X-ray detector, each of the translational mechanisms coupled to a gantry, each of the translational mechanisms configured to move at least one of the X-ray source and X-ray detector from a first position to a second position with respect to the gantry.

27. **As per claim 24**, the examiner found no reference in the prior art that disclosed or made obvious a multi-modality computed tomography system further comprising a translational mechanism associated with each of an X-ray source and X-ray detector, each of the translational mechanisms coupled to a gantry, each of the translational mechanisms configured to move at least one of the X-ray source and X-ray detector co-axially from a first position to a second position with respect to the gantry.

28. **As per claim 25**, the examiner found no reference in the prior art that disclosed or made obvious a multi-modality computed tomography system wherein the detector comprises a linear array of detector elements; the X-ray source configured to sweep a pencil-beam of X-rays in relation o the detector.


### *Conclusion*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Courtney Thomas whose telephone number is (571) 272-2496. The examiner can normally be reached on M - F (9 am - 5 pm).

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ed Glick can be reached on (571) 272 2490. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Courtney Thomas  
Examiner  
Art Unit 2882